

Banking Economics

Lecture 9

The Importance of Banking Intermediation

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Outline, Goals, and Main Bibliography

► Outline:

2. The importance of banking intermediation

2.1. Financial decision-making and the contribution of banking intermediation to economic agents' welfare.

2.2. The economic justifications for the existence of banks.

► Goals:

Formalize, using an intertemporal resource allocation model, the contribution of financial intermediation to the well-being of economic agents.

Identify the reasons that economic theory provides for the existence of financial intermediaries in general, and banks in particular, and recognize the contribution of banks to the proper functioning of the economy.

► Main Bibliography:

Casu, B., Girardone, C., & Molyneux, P. (2006). *Introduction to Banking*. FT Prentice Hall. (Chapter 1, pp.8-19)

Matthews, K., & Thompson, J. (2005). *The Economics of Banking* (3rd ed.). John Wiley & Sons. (Chapter 3)

2.2. The Economic Justifications for the Existence of Banks

- ▶ In lecture 6, we introduced a framework demonstrating how the **welfare of economic agents improves** with the introduction of a financial market.
- ▶ We then further specified how this financial market would operate, particularly regarding the **interest rate formation process**, if it were to take the form of a **capital market**.
- ▶ Based on the two analysis we carried out, it appears there would be **no need for financial intermediaries**, as **lenders and borrowers** could **directly** contact each other to arrange loans.
- ❖ **But financial intermediaries do exist.**
- Therefore, we must provide **sensible reasons** for their **existence**, particularly in the case of **banks**.
- So, we will provide multiple answers for the following question: **what are the economic justifications for the existence of banks?**

Main topics

In the remainder of this chapter, we will address the following topics related to the justification for the existence of banks:

1. Different requirements of borrowers and lenders;
2. Transaction costs;
3. Liquidity insurance;
4. Asymmetry of information;
5. Operation of the payments mechanism.

Note: in this discussion, our focus is on **banks**, i.e., **deposit-taking** or **monetary institutions**. Therefore, we leave out other non-deposit taking institutions, such as pension funds, insurance companies and other financial intermediaries.

1. Different requirements of borrowers and lenders

- ▶ The **utility functions** of **borrowers** and **lenders** differ in **several ways**. In other words, borrowers and lenders have **different preferences** with respect to funds.
- ▶ This preference mismatch occurs along three dimensions: **size**, **maturity** and **risk**.
- ▶ **Banks** are usually **better positioned** to deal with the preference mismatch by performing a **transformation function**.

Size transformation: “Bank will collect a number of smaller deposits, parcel them together and lend out a larger sum” (Matthews and Thompson, 2005).

Maturity transformation: “Banks are able to carry out maturity transformation because they have large numbers of customers and not all customers are likely to cash their deposits at any one particular time” (Matthews and Thompson, 2005).

Risk transformation: banks are better positioned to diversify their loan portfolios, obtain collateral from borrowers, and manage other related aspects.

2. Transaction costs

- ▶ Apart from banks being well-positioned to bridge borrowers and lenders' distinct and far-from-compatible preferences, one additional reason put forward for the dominance of financial intermediation over direct lending/borrowing lies in the **existence of transaction costs.**
- ▶ **Transaction costs** is a broad term that encompasses a wide range of costs associated with the **process of transferring funds** from **lenders** to **borrowers.**
- ▶ These costs include:
 - ✓ **Search costs;**
 - ✓ **Verification costs;**
 - ✓ **Monitoring costs;**
 - ✓ **Enforcement costs.**

2. Transaction costs (cont.)

- ▶ In order to examine the implications of **transaction costs**, we will now introduce such costs into our **model of intertemporal resource allocation** without productive investment.
- ▶ First, we will consider the existence of a **1) capital market (direct finance)** and then the existence of a **2) bank (indirect finance)**.
- ▶ By comparing these two cases, we will conclude that **banks can be beneficial to the welfare of economic agents by reducing transaction costs.**

2. Transaction costs (cont.)

Regarding the first case, assuming the **existence of transaction costs**, and defining:

r : capital market interest rate

T_s : transaction cost for the saver (as a percentage)

T_b : transaction cost for the borrower (as a percentage)

Then:

R_s : return to the saver (as a percentage)

R_b : cost to the borrower (as a percentage)

With:

$$R_s = r - T_s \text{ and } R_b = r + T_b$$

The total cost of the financial transaction is:

$$R_b - R_s = T_b + T_s$$

2. Transaction costs (cont.)

► Consumption choices of the **saver**:

- **Investment** in the financial market = $Y_1 - C_1$

$$C_2 = Y_2 + (Y_1 - C_1)(1 + r - T_s)$$

- Slope of the **saver's** financial market line:

$$\frac{\partial C_2}{\partial C_1} = -(1 + r - T_s)$$

► Consumption choices of the **borrower**:

- Debt = $C_1 - Y_1$

$$C_2 = Y_2 - (C_1 - Y_1)(1 + r + T_b)$$

- Slope of the **borrower's** financial market line:

$$\frac{\partial C_2}{\partial C_1} = -(1 + r + T_b)$$

2. Transaction costs (cont.)

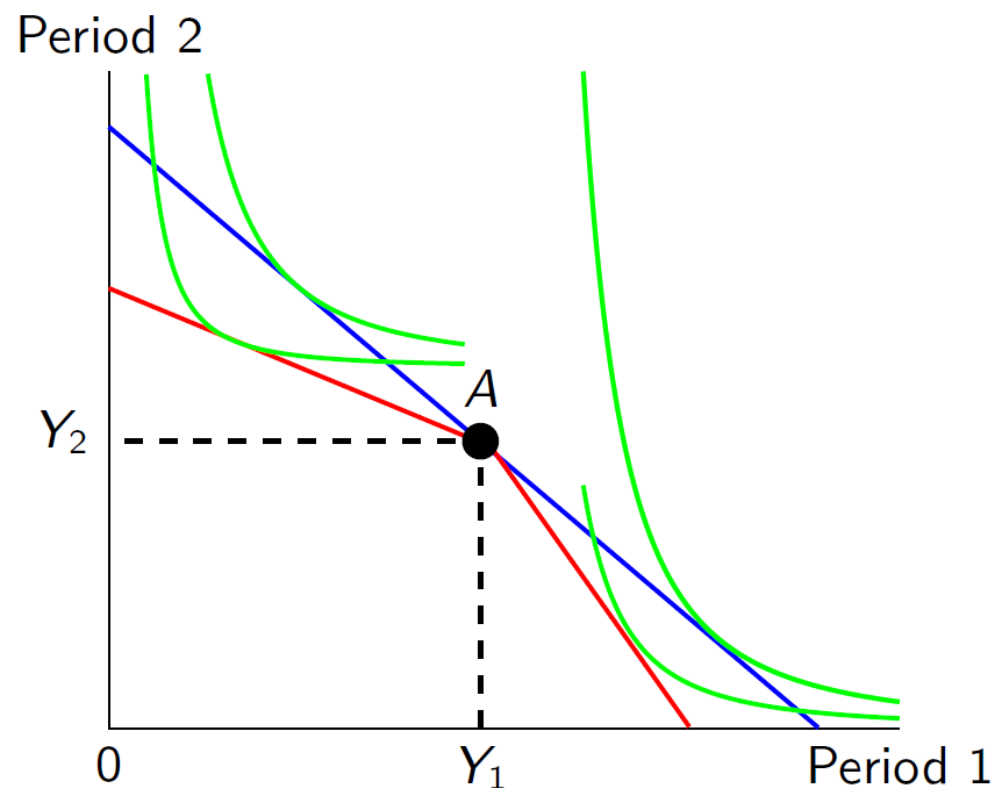


Figure 1. The financial market line with transaction costs

Blue line: financial market line with no transaction costs.

Red line: financial market line with transaction costs.

The existence of transaction costs results in **welfare losses** for both **savers** and **borrowers**.

2. Transaction costs (cont.)

Let us move on to our second case, in which, instead of a generic financial market, we introduce a **bank**. The **bank** has its **own transaction costs**, which will be **fully borne** by the **borrower**. Assuming:

T'_s : transaction cost for the saver (after the creation of the bank)

T'_b : transaction cost for the borrower (after the creation of the bank)

T : transaction cost for the bank, which, by assumption, is entirely borne by the borrower

Then:

R'_s : return to the saver

R'_b : cost to the borrower

With:

$$R'_s = r - T'_s \text{ and } R'_b = r + T'_b + T$$

The total cost of the financial transaction is:

$$R'_b - R'_s = T'_b + T'_s + T$$

2. Transaction costs (cont.)

The total transaction cost (without a bank) is **greater** than the total transaction cost (with a bank):

$$T_b + T_s > T'_b + T'_s + T$$

That is:

$$(T_b + T_s) - (T'_b + T'_s) > T$$

- This means that the **reduction in transaction costs for savers and borrowers more than offsets the transaction cost of the bank.**

Furthermore, for **savers** to achieve welfare gains:

$$T'_s < T_s$$

And for **borrowers** to achieve welfare gains:

$$T'_b + T < T_b$$

2. Transaction costs (cont.)

► Saver's choices:

- Investment in the financial market = $Y_1 - C_1$

$$C_2 = Y_2 + (Y_1 - C_1)(1 + r - T'_s)$$

- Slope of the **saver's** financial market line:

$$\frac{\partial C_2}{\partial C_1} = -(1 + r - T'_s)$$

$$|\alpha'_s| > |\alpha_s|$$

► Borrower's choices:

- Debt = $C_1 - Y_1$

$$C_2 = Y_2 - (C_1 - Y_1)(1 + r + T'_b + T)$$

- Slope of the **borrower's** financial market line:

$$\frac{\partial C_2}{\partial C_1} = -(1 + r + T'_b + T)$$

$$|\alpha'_b| < |\alpha_b|$$

2. Transaction costs (cont.)

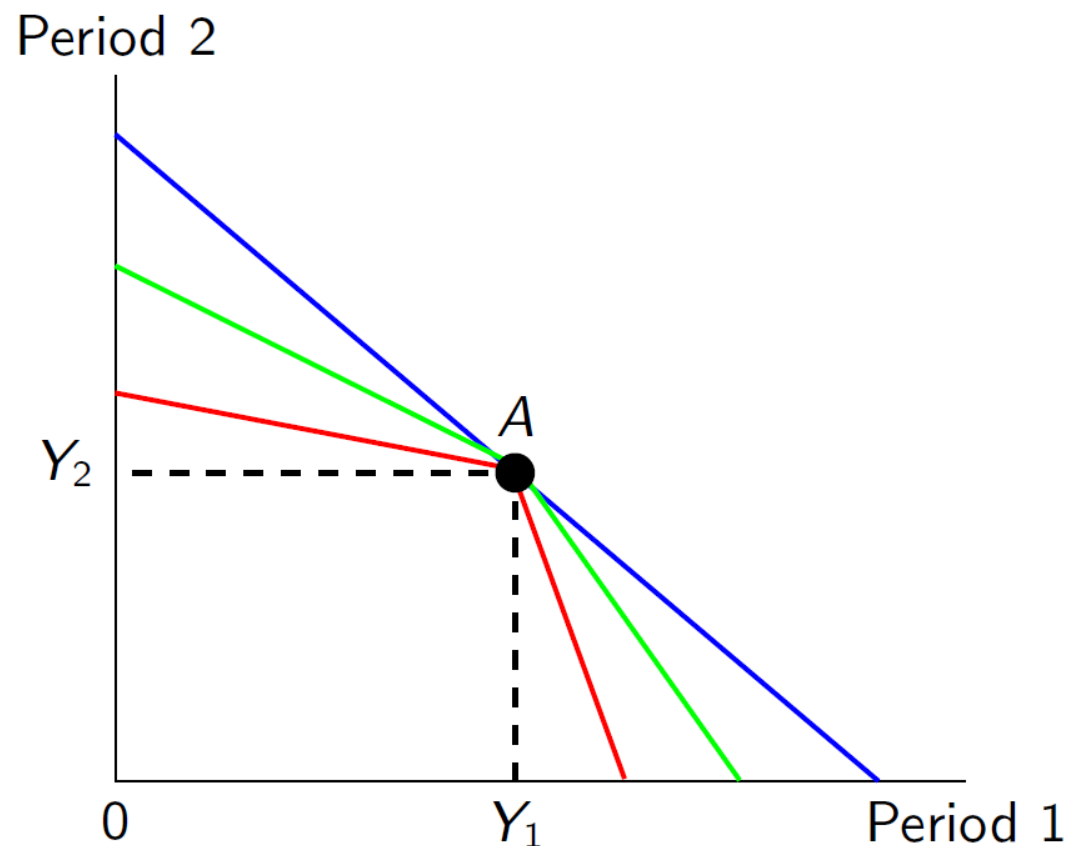


Figure 2. Introducing a bank in our model
Note: indifference curves are not shown to avoid overcomplicating the graphical representation.

Blue line: financial market line with no transaction costs;
Red line: financial market line with transaction costs (in the absence of a bank);
Green line: financial market line with transaction costs (with a bank).

The presence of a bank results in **welfare gains** for both **savers** and **borrowers** relative to the scenario where a bank is absent.

2. Transaction costs (cont.)

- ▶ **Main Conclusion:** Provided that $T_b + T_s > T'_b + T'_s + T$ (or $(T_b + T_s) - (T'_b + T'_s) > T$) - that is, provided that banks can reduce transaction costs for savers and borrowers by an amount greater than the charge levied by them (T) - we conclude that the introduction of banks improves welfare from the perspective of economic agents.
- ▶ We now examine the reasons for believing that the reduction in the total costs incurred by borrowers and lenders will exceed the charge levied by the bank, thereby supporting the conclusion that banks are welfare-improving institutions.
- ▶ In other words, we will analyze arguments for why the condition $T_b + T_s > T'_b + T'_s + T$ holds.

2. Transaction costs (cont.)

The main arguments for believing that the **reduction** in the **total costs** incurred by borrowers and lenders **will exceed the charge** levied by the bank include:

- ❑ The existence of banks **reduces search costs** for both borrowers and savers;
- ❑ With banks, **contractual arrangements** are **easily carried out** through standard contract forms, meaning that a new contract does not have to be negotiated for each loan, thereby reducing transaction costs;
- ❑ Banks can exploit **economies of scale** that arise due to the **presence of fixed costs** (example: bank X incurs a fixed cost to develop a model to monitor borrowers; isn't it rational to use it for as many clients as possible, provided that the marginal cost of using the model after its development is nearly zero?);
- ❑ Banks can exploit **economies of scope** that arise due to the **complementarity between loans and deposits**, or across different types of loans/deposits. (Intuition: Banks have the expertise and client information to offer service X; if service Y requires the same expertise and set of information, why not offer both?).

3. Liquidity Insurance

Diamond and Dybvig (1983) present an argument for the existence of banks, which follows these lines:

Liquidity Insurance

- ▶ In an environment marked by uncertainty, consumers **cannot predict** when they will need liquid funds to **finance consumption** in response to **unanticipated events**.
- ▶ Consequently, consumers **must maintain a certain level of liquid reserves** to manage such shocks, which may disrupt their consumption levels.
- ▶ Provided that these unanticipated events affect consumers differently or at different times - i.e., when these **shocks to individual consumers are not perfectly correlated** - portfolio theory suggests that the total liquid reserves required by a bank **will be less** than the aggregate reserves needed if individual consumers act independently.
- ▶ Thus, the existence of banks **reduces the amount of funds** that need to be **immobilized**, thereby contributing to a **more efficient** allocation of resources.

3. Liquidity Insurance (cont.)

Example

- ❖ Consider an economy with N distinct consumers. To maintain their ideal level of consumption in the event of an adverse shock, each consumer keeps a **liquidity reserve** of an amount q . Without banks offering deposit contracts, the total amount of immobilized funds would be $N * q$.
- ❖ Conversely, if **banks existed**, and assuming that the individual shocks to consumption affecting each consumer are **not perfectly correlated**, banks could offer deposit contracts to attract consumers' reserves ($N * q$). However, the banks would **only need to maintain a fraction of that amount ($< N * q$) as reserves**, while **lending out the remaining fraction** for productive uses.
- ❖ This is because banks know that, in any given period, **only a fraction of consumers** - not all - **will experience a consumption shock and withdraw their reserves**. The remaining consumers will not need to access their funds, allowing the banks to retain these reserves and allocate them to productive activities.

3. Liquidity Insurance (cont.)

- In conclusion, banks, by offering deposit contracts, ensure that the **liquidity reserves** of **economic agents** are utilized more effectively, fostering an **efficient** allocation of resources.
- This argument becomes even more compelling when we consider that **alternative investment options** available to economic agents - such as **direct investment** in the capital market or **productive investments** - **fail to offer the liquidity features** that agents need to safeguard their financial needs in times of uncertainty.

4. Asymmetry of information

- ▶ **Information** is a pivotal element in shaping financial markets and the activities underlying financial intermediation.
- ▶ However, economic agents possess **different sets of information**. In other words, not everyone has access to the same information.
- ▶ This **asymmetric distribution and dissemination** of information can potentially **disrupt** the efficient functioning of financial markets and financial intermediation.
- ▶ The **asymmetry of information** argument for the existence of **banks** relies on the idea that banks play a crucial role in **addressing problems arising from asymmetric information** between **lenders and borrowers**.

4. Asymmetry of information (cont.)

► **Lender-borrower** asymmetric information raises two main problems:

1. Adverse selection

- It is normally understood as an *ex-ante* problem, meaning it typically arises **before** financial contracts have been agreed upon.
- It refers to the phenomenon where lenders are **unable to distinguish** “good” borrowers from “bad” borrowers due to the lack of high-quality information on potential borrowers.
- Ultimately, this leads to an **inefficient allocation** of funds, as “bad” borrowers are able to secure funding in such circumstances, leaving “good” borrowers without access to finance.

4. Asymmetry of information (cont.)

2. Moral Hazard

- It refers to the risk that a borrower may engage in activities that **reduce the likelihood of the loan being repaid**.
- Therefore, it is often viewed as an *ex-post* problem, meaning it arises **after** the financial contract has been agreed upon.
- Additionally, it stems from the **inability** of lenders to **access information** and **effectively monitor** the activities of borrowers.

4. Asymmetry of information (cont.)

- ▶ Both adverse selection and moral hazard are detrimental to the efficient channeling of funds from savers to borrowers.
- ▶ For each of these asymmetric information problems, we will examine how they hinder the proper allocation of funds to their most productive uses and explore how the introduction of a bank can help overcome these challenges.

Adverse Selection

Adverse selection is a key problem:

- ▶ A potential borrower requesting credit **knows more** about their investment project, potential profitability, and repayment capacity than the lender;
- ▶ Lenders are **unable to distinguish** between “good” and “bad” borrowers;
- ▶ To mitigate risk, lenders set an interest rate reflecting the **average quality** of borrowers.

Consequences of Adverse Selection:

- A “**good**” borrower may feel their project risk is **overestimated** and the cost of financing is **too high**;
- Conversely, a “**bad**” borrower, aware of the **high risk** of their project, sees it as a **good financing opportunity**.

Outcome:

- ❑ The adverse selection problem arises from **information asymmetry**;
- ❑ Prices (interest rates) fail to accurately **reflect the quality** of borrowers;
- ❑ Leads to an **inefficient allocation** of resources.

Adverse Selection (cont.)

- ❑ If the bank sets the interest rate on credit at a very high level, only the worst borrowers are willing to accept it.
- ❑ Consequently, the **expected profit** becomes a non-monotonic function of the interest rate because, **beyond a certain level**, the proportion of **poor-quality credit** increases.

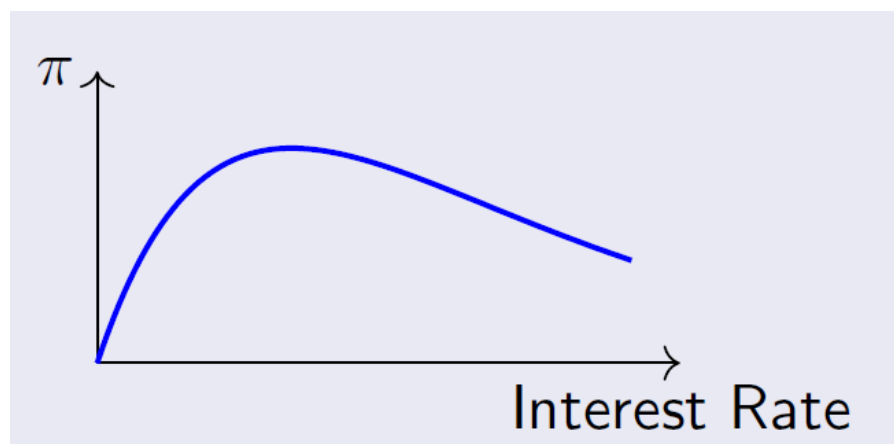


Figure 3. Expected Profit as a Function of the Interest Rate (Adverse Selection)

Adverse Selection (cont.)

So, the interest rate per se is not an effective instrument for overcoming the problem of adverse selection. So why are banks particularly good at addressing such issues?

- ▶ Unlike other agents, banks have **strong incentives to gather information on potential borrowers**;
- ▶ A bank will require a firm to produce a **business plan** before granting a loan. Given the **number** of such plans **examined**, a bank will have developed **special expertise** in **assessing** such plans and will therefore be **more competent** in judging the **validity** of the plan and separate the **viable** from the **nonviable** projects.
- ▶ Banks typically establish **long-term, close relationships** with their clients, which allows them to **gather valuable information** about **investment prospects** and the **future outlook** of the firms.

So, **individual savers may not have the time, capacity, or means** to collect and process information on a wide array of potential borrowers, but **banks do**.

Two other aspects within the financial system play an important role: **credit rating agencies (CRAs)** and **public agencies** that regulate the **disclosure** of **relevant information** about companies to the market.

Moral Hazard

Moral Hazard

Once a loan has been granted, there is a risk that the borrower may **engage** in **activities undesirable** from the lender's perspective (moral hazard). Why are **banks** well-positioned to address such issues? The literature emphasizes that:

- ▶ Banks possess a **competitive advantage** in **monitoring** borrowers' activities due to their **close relationships** with borrowers, which allows them to **access private information** about the borrowers (e.g., banks often operate the client's current account and therefore have private information concerning the client's **income** and **expenditure flows**). This gives individual savers an incentive to **delegate monitoring** to a third party, the bank, thus **avoiding duplication of effort**;
- ▶ Banks set **conditions** in the **loan contract** that can be **verified over time** (e.g., restraints on further borrowing while the loan is outstanding). The bank is able to **monitor compliance** with these conditions. Additionally, **collateral security** is often required. Failure to adhere to the terms of the agreement will result in the **loan being canceled** and the **collateral being forfeited**.

5. Operation of the payments mechanism

- ▶ This argument asserts that **banks' operation of the payments mechanism** gives them a **significant advantage** over their rivals in the role of financial intermediaries.
- ▶ The key point is that **banks are monetary institutions** - that is, **deposit-taking institutions** - which offer one form of **money: deposits**.
- ▶ Through their lending activities, **banks create money** by crediting borrowers' deposit accounts. With the **dematerialization** of payment methods and the prevalence of **deposits**, banks have become the **primary operators** of the payments mechanism. As such, they are better positioned to perform financial intermediary activities due to their **better position to monitor borrowers**.

Argument: “A bank has a special advantage in the monitoring process since it will often be operating the client's current account and will therefore have private information concerning the client's flows of income and expenditure.” (Matthews and Thompson, 2005)

5. Operation of the payments mechanism (cont.)

Why the argument is likely to hold

- ▶ The currency issued by banks (Demand Deposits - DD) is the most **widely used form of payment** (in the Eurozone, it accounts for more than 80% of payment methods). Therefore, banks can **gather private information** about their **clients' expenses** and **financial flows**, build **closer relationships** with them, and ultimately position themselves as particularly well-suited to carry out **intermediation activities**.

Nevertheless, we must not forget that this **deposit-related service** is **expensive** to provide. Demand deposits circulate **securely, quickly, and efficiently** through the following means: checks, debit cards, electronic transfers, automatic periodic payments, and Internet/mobile transfers.

However, to **facilitate transfers across deposits** held at **different banks**, banks must participate in **wholesale payment systems**, which are **more complex** than they may initially appear. Examples include TARGET2, TIPS, CHIPS, and others.

5. Operation of the payments mechanism (cont.)

Will this argument hold forever?

The payment system is **constantly evolving**.

- ▶ For example, will the **role of banks** within the **payment system** change with the introduction of **Central Bank Digital Currencies (CBDCs)**?

The answer likely depends on **how** central banks choose to implement CBDCs:

- ▶ Wholesale CBDCs;
- ▶ Retail CBDCs...